

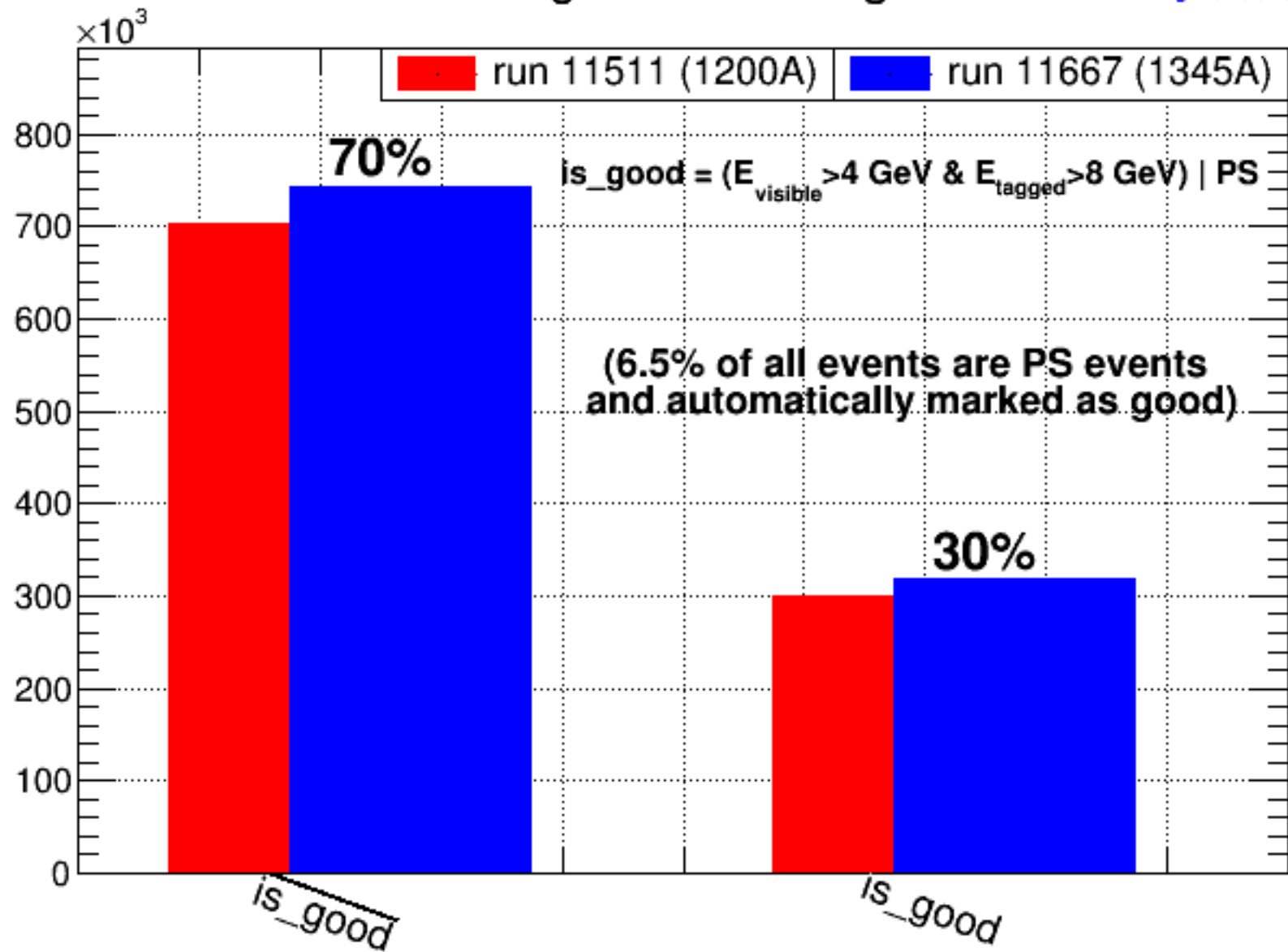
L3: Classifying good events

David Lawrence JLab

July 8, 2015

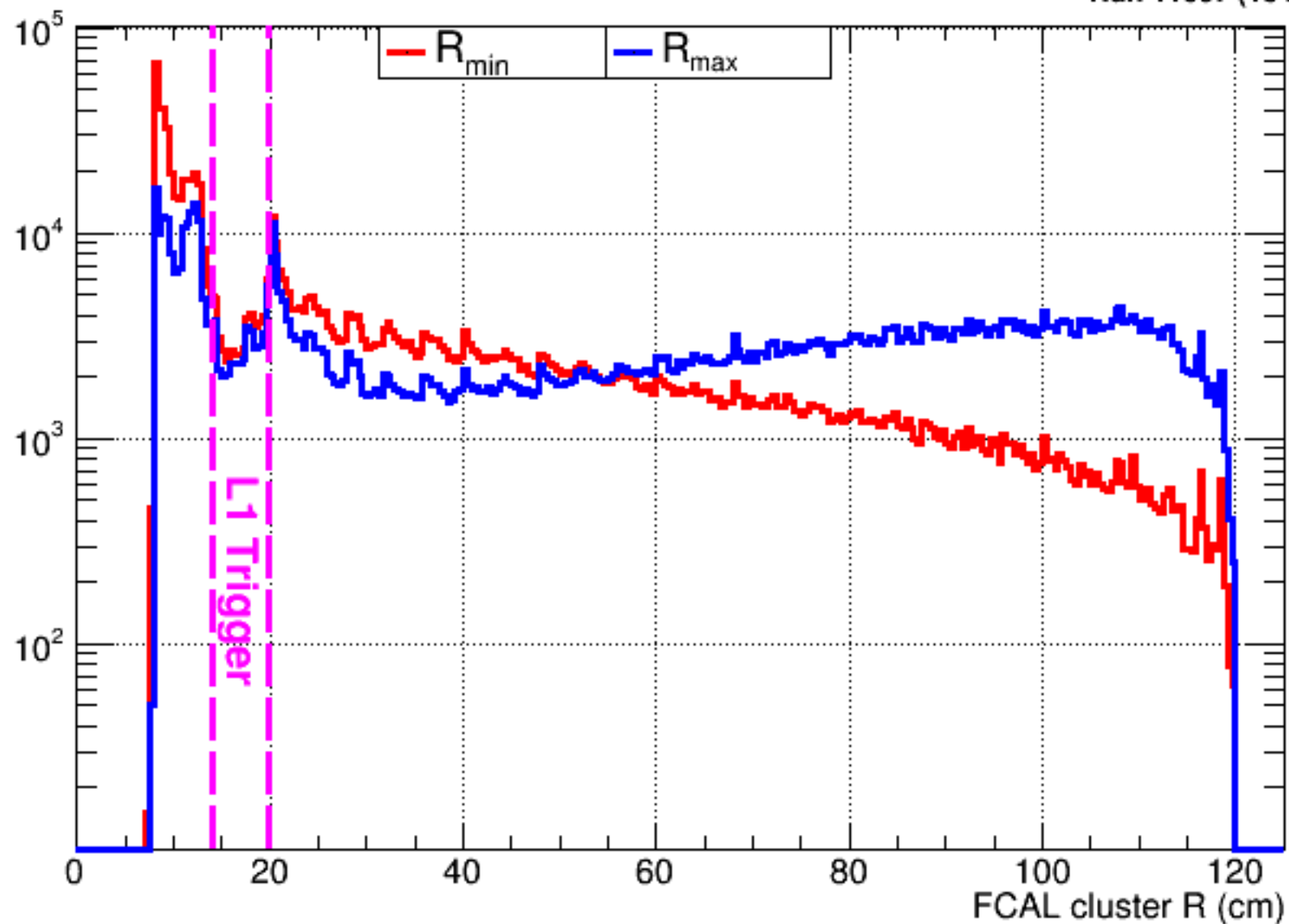
L3 good event flag

July 7, 2016 DL
git revision #7118b85

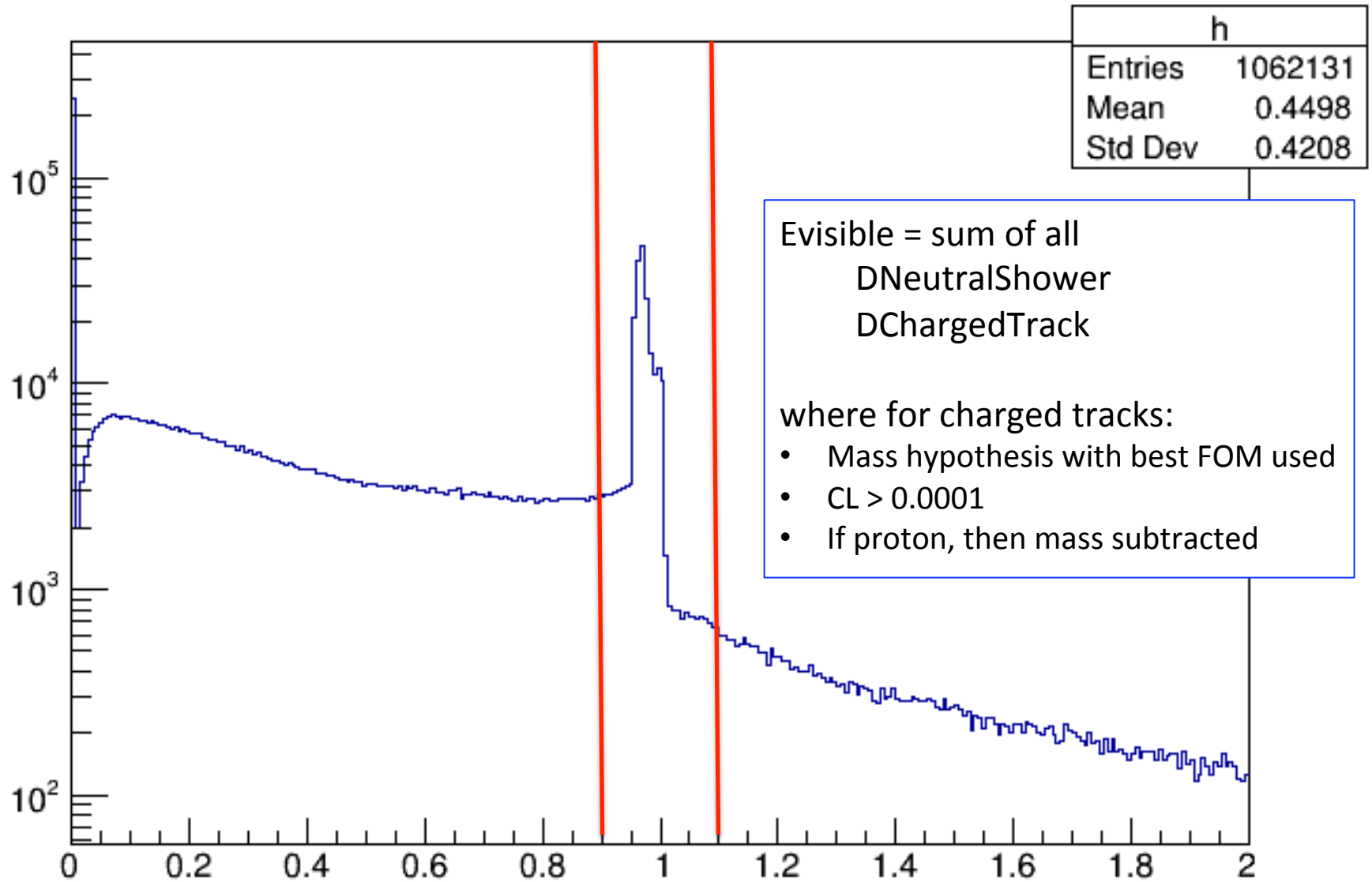


FCAL cluster R

July 7, 2016 DL
git revision #7118b85
Run 11667 (1345A)

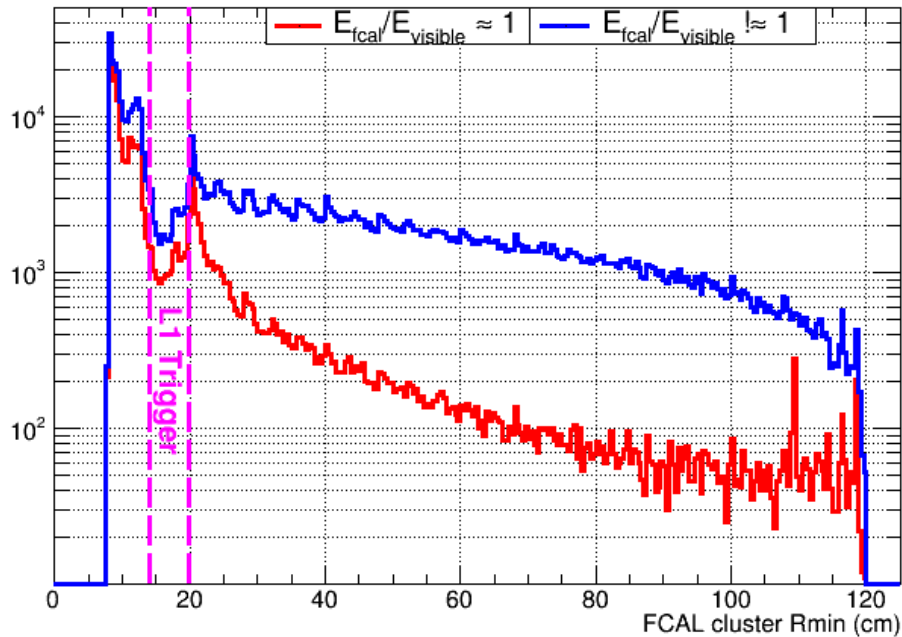


Efcals_clusters/Evisible



FCAL cluster Rmin

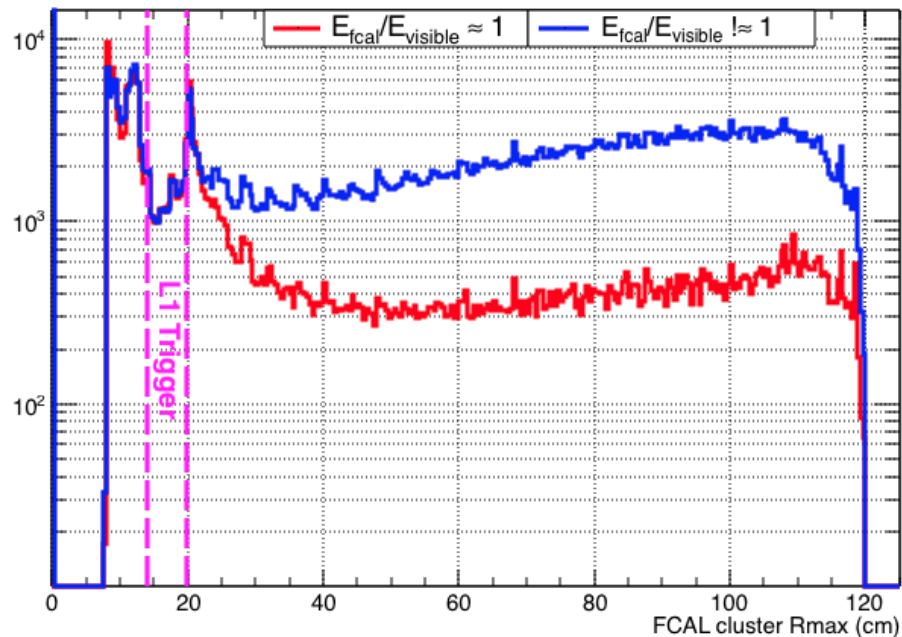
July 7, 2016 DL
git revision #7118b85
Run 11667 (1345A)



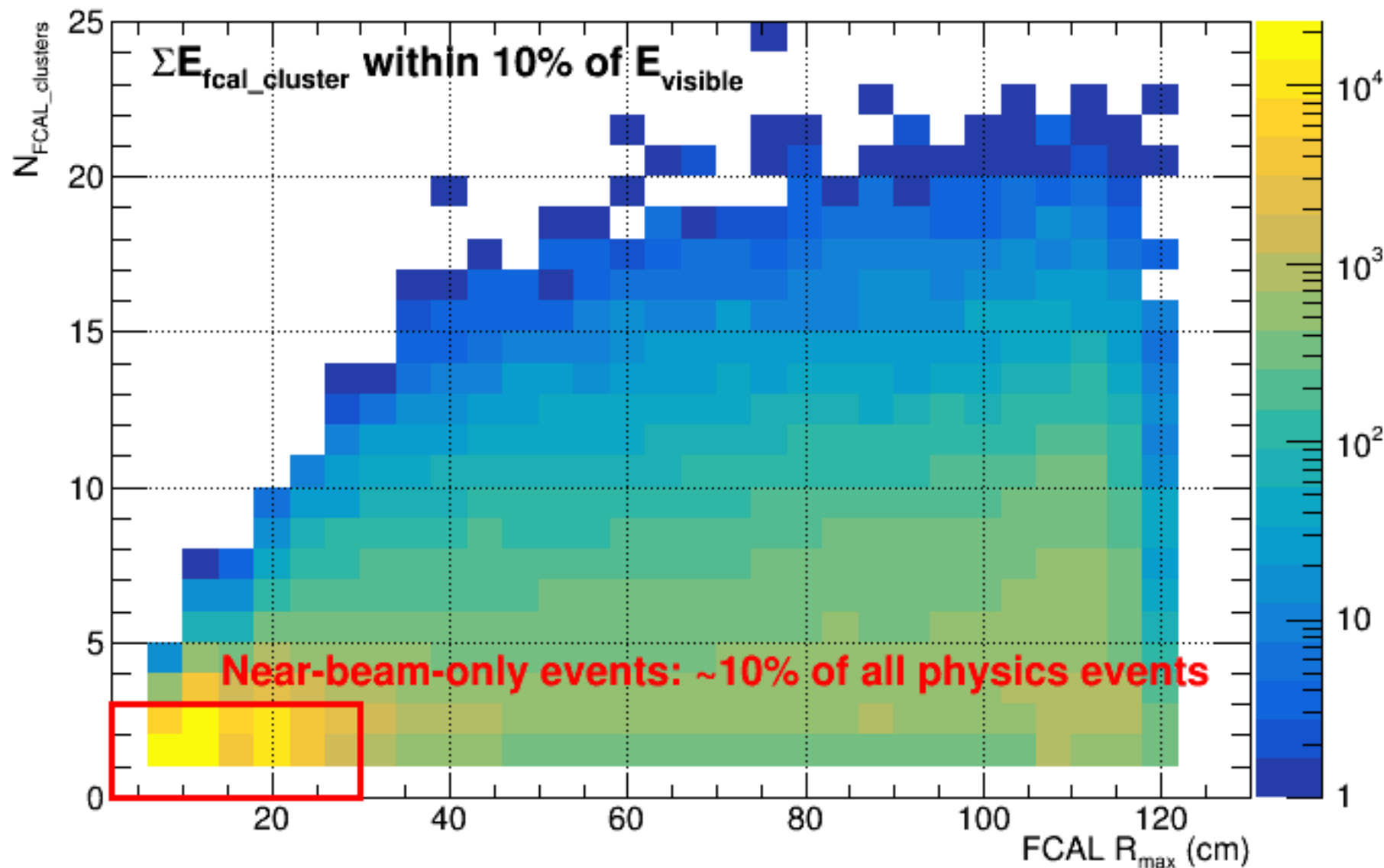
FCAL Rmin and Rmax
for when most of Evisible is
inside (outside) of FCAL

FCAL cluster Rmax

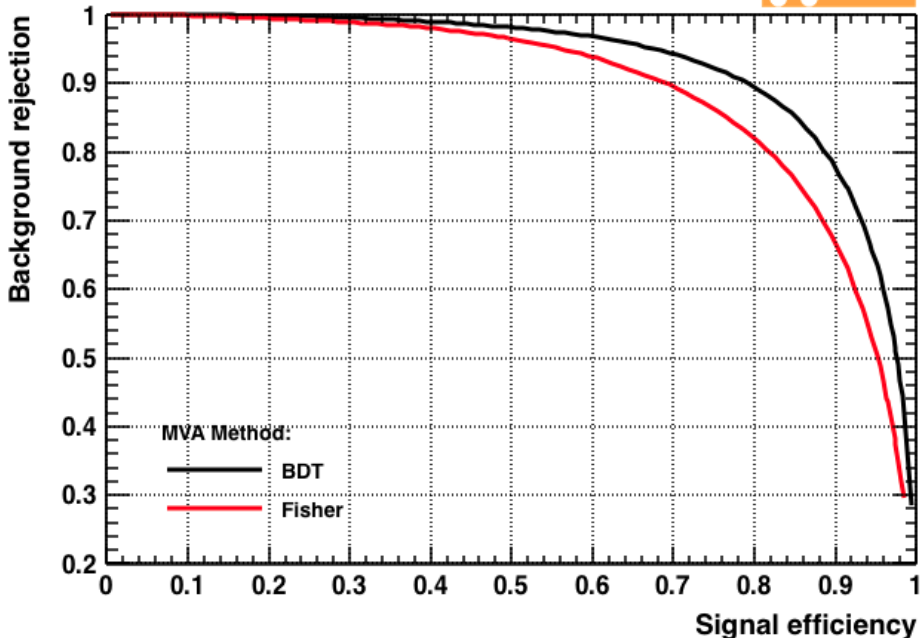
July 8, 2016 DL
git revision abc1904
Run 11667 (1345A)



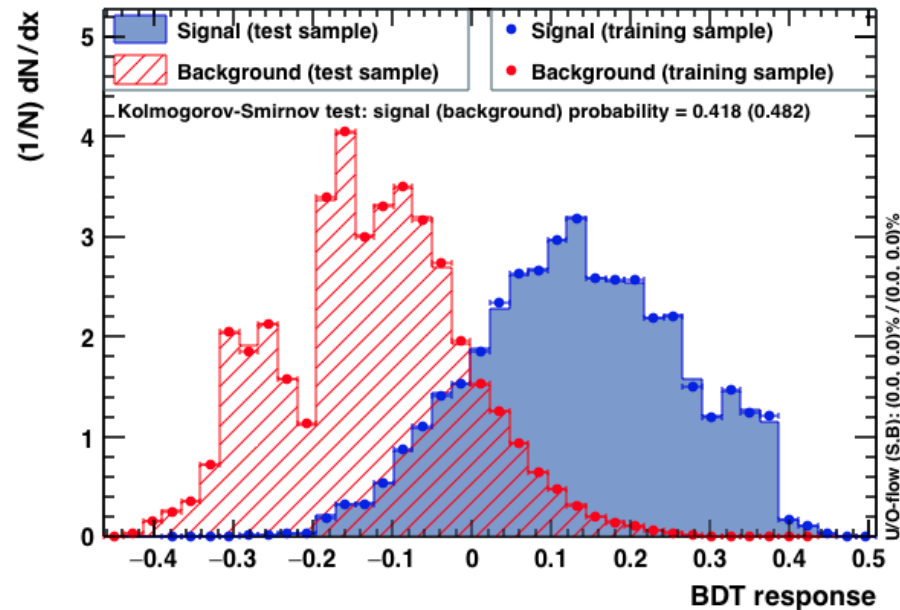
FCAL N_{clusters} vs. R_{max}



Background rejection versus Signal efficiency



TMVA overtraining check for classifier: BDT



```

--- BDT      : Ranking result (top variable is best ranked)
--- BDT      : -----
--- BDT      : Rank : Variable      : Variable Importance
--- BDT      : -----
--- BDT      : 1 : Efccl_clusters : 1.917e-01
--- BDT      : 2 : Ntrack_candidates : 1.710e-01
--- BDT      : 3 : Nfccl_clusters   : 1.279e-01
--- BDT      : 4 : Nbccl_points     : 1.258e-01
--- BDT      : 5 : Npshits          : 8.291e-02
--- BDT      : 6 : Ebccl_points     : 7.186e-02
--- BDT      : 7 : Ebccl_clusters   : 6.445e-02
--- BDT      : 8 : Ntof             : 6.424e-02
--- BDT      : 9 : Nstart_counter  : 5.138e-02
--- BDT      : 10 : Nbccl_clusters  : 4.873e-02
--- BDT      : 11 : Ptot_candidates : 0.000e+00
--- BDT      : 12 : Npschits        : 0.000e+00
  
```

\$SHALLD_HOME/src/plugins/Utilities/I3bdt

Next steps

- Add more variables to MVA analysis
 - Higher-level (e.g. fully reconstructed tracks, showers)
 - Lower-level (e.g. CDC/FDC hits, BCAL/FCAL hits)
- Test and optimize for signal efficiency/
background rejection
- Identify highest ranked variables and group
based on algorithm cost
- Repeat for simulated data set